Alberta
AGRICULTURE

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Research Report

Nutrient Valley, Alberta

Putting agri-industry on the map

One of the more intriguing proposals for agricultural diversification put forth at Alberta Agriculture's, Alternative Crops Conference in Lethbridge last November is the brainchild of Mr. Percy Gitelman, president of UFL Foods in Toronto. He suggests Alberta should establish a "Nutrient Valley," similar in concept to California's famous "Silicon Valley," a community of high-tech firms where intellectual resources, new technology and financial capital have been concentrated with spectacular results.

Mr. Gitelman envisions a community of industrial plants which would extract nutrients and other products from agricultural crops and create new products. He notes that plants, just like petroleum, consist of building blocks, for instance, starches and cellulose. These can be extracted, altered and reassembled in a wide variety of profitable ways.

The advantages of concentrating these agricultural-industrial operations in one area would be the same as in California, with the added advantage that in this kind of production, the by-products of one plant can often be put to good use in other processing operations.

According to Mr. Gitelman, only 2.1% of Canadian wheat and 0.4% of Canadian barley are used to create value-added products other than animal feeds. Non-traditional uses for our food products would expand Canadian markets and would provide a boost to the secondary processing industry in Alberta.

Mr. Gitelman uses the example of polyhydroxy butyrate or biodegradable plastic. The North American demand for this product will reach 100,000 tonnes per year by 1990, he predicts. A total of 120,000 tonnes of starch would be needed to produce one-third of the annual demand for this new product. He says we must produce the strategy to attract plants like this to Alberta.

"Agriculture is our second-most important renewable resource," says Mr. Gitelman, noting that people are the most important. "Agriculture and industry could cooperate to combine whole crop harvesting with agricultural refineries. Alberta is an ideal place for Nutrient Valley." Among the advantages of the province, he counts an excellent Food Science Department at the University of Alberta, the Food Processing Development Centre in Leduc, the University's Faculty of Medicine in Edmonton, and excellent agricultural research and marketing facilities."

One other Alberta resource that might possibly be put to such good use, says Mr. Gitelman, is the Alberta Heritage Fund. He ventures that it could be used to supply the leadership and infrastructure necessary for such an ambitious but potentially-rewarding endeavor.

Let a thousand flowers bloom

Another reason for alternative crops

Historically, says R.L.M. (Dick) Dawson, vice-president of Winnipeg's Cargill Canada Ltd., attempts at crop diversity on the prairies have met with less than overwhelming success. "Apart from canola, we have not read worldwide signals well," he says. Instead, we have tended to rely on our traditional businesses, our historic customers, "our precious high protein, highly vitreous, visually identifiable spring wheats. Very few alternatives were even allowed to be introduced or tested. Certainly there was very little funding for diversification." It is high time, he says, for prairie farmers, agriculturists, civil servants and politicians to drop what he calls the wheat mentality. "We can and we must diversify our agricultural practices," he says, "and revive our secondary industries on the prairie."

Mr. Dawson, a well-received speaker at the Alberta Agriculture Alternative Crops Conference in Lethbridge last November, says the prairies have paid a huge price for their monocultural practices. "We now hear frequently voiced statistics that the prairie soils have lost 40% of their fertility since the Second World War," he says. "Even today, about 190 million tonnes of precious topsoil is blown from the prairie every year." He adds that not all the losses have been so tangible; the creativity of farmers and researchers and businessmen has been stifled or discouraged for years because of concentration on wheat.

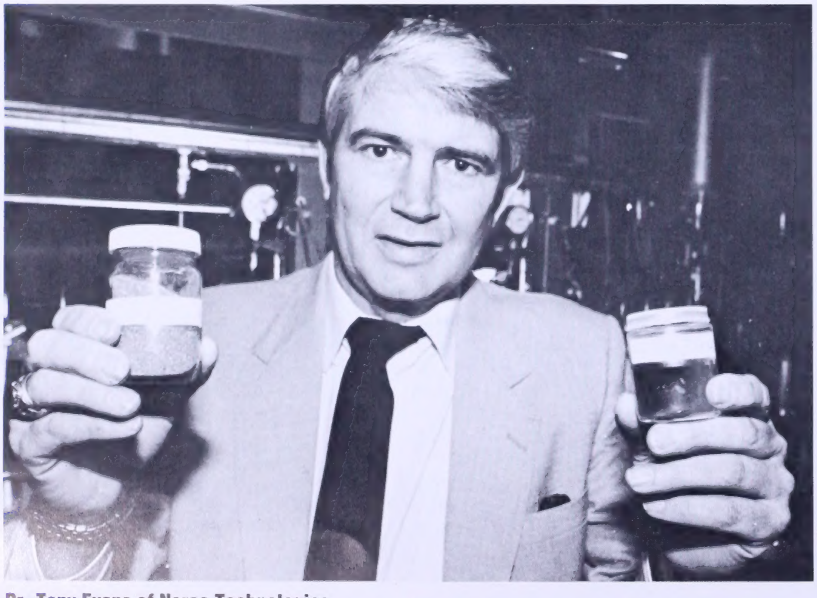
Mr. Dawson says there is "a whole chain of flexible opportunities ahead of us," but in order to proceed, everyone involved in agricultural production in Canada – from the individual farmer to the food-processing corporations to the government of the day – must be prepared to make a unified effort. "More than just adding a new variety," he says, "diversification involves the freedom to make mistakes and the freedom to invest in new processing technology, new products and in secondary industry, with the right to be wrong

"Diversification involves the freedom to make mistakes and the freedom to invest in new processing technology, new products and in secondary industry, with the right to be wrong and the right to be right."

Cargill Canada Ltd. V.P. Dick Dawson

Crumbs!

There's more to wheat than meets the eye



Dr. Tony Evans of Norac Technologies

There are few things Canadians do better than grow wheat, says Dr. Tony Evans, so its high time we did more with it than sell it on export markets. "Sure, we can sell it," he says, "but we should also think of this crop as starch, high fructose syrup, alpha tocopherol and specialized bran products! We must think this way if we are to optimize our potentials in this province."

A continuous extrusion process, says Dr. Evans, can be used to cook and expand grains to produce crumbs, snack foods and breakfast cereals. Crumbs may not be a glamorous product, but they are used in a wide variety of processed foods, including battered fish sticks and take-out fried chicken. In the United States, some 225,000 tonnes of grain are used annually to produce crumbs.

"We grow wheat, and then we import wheat germ oil from West Germany."

A good place for prairie wheat growers to start, says Dr. Evans, would be to process wheat into starches that could be used to produce chemicals, glues, dyes, and myriad other products. "Starches are one of the great industrial raw materials," he says. "We could begin producing to meet our domestic re-

and the right to be right. We have many barriers and blockages to get over to accomplish those dreams. And it can only be accomplished to the extent of its weakest link."

Mr. Dawson warns that if Canadian agriculture doesn't study and learn from its successes in Canola, if it doesn't learn to read markets and respond quickly and effectively to changing conditions, the nation could wind up in a state of "agricultural economic bankruptcy."

Mr. Dawson made it clear he is bothered by the present costs of an undiversified agricultural economy: "I don't see why, when we have difficulty selling a ton of wheat at $130 on the world market, we should have to close the Christie's Biscuit Factory in Winnipeg when I have just paid $16,000 a ton for this package of rye wafers imported from Rotterdam purchased last Saturday in a Safeway store in Winnipeg."

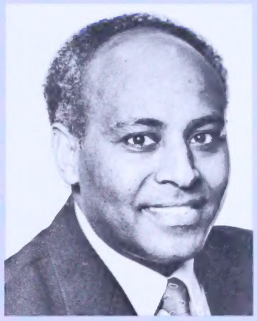
That notwithstanding, he is optimistic for the future of the industry. He notes that in Manitoba, more than 20% of farm income is now derived from non-traditional crops, and he says the numbers are improving in the rest of the West as well. He sees great potential for alternative crops in Southern Alberta. "I regard it as an exciting and a wonderful future," he concludes. "Let us rekindle the wonderful spirit of the millions of immigrants who came here full of courage and of hope to build a new land. Let us open up the window of opportunity for agriculture with some options and some freedoms, and, to steal a phrase from Chairman Mao's famous little red book, we must have confidence to 'let a thousand flowers bloom.'"

quirements and afterwards enter the export marketplace."

Dr. Evans' firm, Norac Technologies, uses a super-critical extraction process to draw valuable compounds and products from grains and special crops. Highly compressed carbon dioxide is used to absorb specific oils or flavours from the raw material. He has extracted wheat germ oil from wheat germ, as well as essential oils from coriander, caraway and dill. He has also extracted gamma linolenic acid (GLA) from borage, a crop which grows well in Alberta. Dr. Evans adds that super-critical extraction or refining of canola oil without the use of hexane, is a possibility for the future.

One of the great barriers to the building of agricultural processing industries in Canada, says Dr. Evans, has been a domestic policy which has encouraged the export of cereals in preference to processing them at home. "We grow wheat," he says, "and then we import wheat germ oil from West Germany." This is encouraged by Canada's two-tier pricing policy for wheat, which he says "discourages the competitiveness of the processing industry in this country." But he insists the problems are not insurmountable. "I've been reading in the news lately that the two-tier pricing system may be abandoned," he says, "and if it can be abandoned and replaced with something that will still protect farmers, things will get exciting. We have the best wheat in the world here. There will be wonderful opportunities." A healthy processing industry, he says, would create more jobs , lead to a stronger economy, and develop the kind of processing technology Canada needs.

FARMING FOR THE FUTURE



Dr. Yilma Teklemariam
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In this issue of Research Report, we are featuring articles which describe presentations made in Lethbridge, on November 12 and 13, 1987. At that time, the Farming for the Future Council, Alberta Agriculture, and the Pulse Growers Association of Alberta sponsored an Alternative Crops Conference. The level of interest in new information shown by producers at this "standing-room-only" conference was most encouraging.

When the Farming for the Future Program was announced in 1977, producer enthusiasm in special crops was not as high as it is today. However, with excellent foresight, the Farming for the Future Council, which was formerly known as the Agricultural Research Council of Alberta, created a Special Crops Committee in 1978 to encourage research into the production of special crops. That decision gave special crops a status similar to that of our major grains and livestock in the allocation of the program's research funds.

Since then, the Council has awarded $2.5 million to 46 alternative crop research projects ranging from plant breeding and variety testing to disease and insect control. Also, 23 special crops demonstration projects have been conducted across Alberta at a total cost of over $206,000.

The Lethbridge conference brought together experts from the private sector, universities and government to share the latest technical and marketing information with producers. In addition to the presentations described in this edition of Research Report, researchers spoke about their work related to such crops as: peas; lentils; forages; safflower; sunflower; herbs; spices; sorghum; beans; corn; buckwheat; Jerusalem artichoke; soybeans; chickpeas; mushrooms; canary seed; millet; peanuts; wild rice and fruits. They discussed such diverse topics as weed control, disease control, harvesting techniques and marketing methods.

Although many of these crops show potential for production in Alberta, the speakers made it clear that there is no "magic crop" on the horizon ready to be used as a profitable substitute for any of our major grains and oilseeds. At the same time, conference participants were able to learn about the experiences of producers who have successfully diversified their grain operations by adding new enterprises and taking advantage of new markets.

Speakers also noted that crop diversification should be viewed in a broader context of agricultural diversification. Expansion of the livestock sector and growth in food processing were mentioned as areas where market opportunities may open for both new and traditional crops, thus encouraging greater crop diversification.

The Farming for the Future Council was pleased that a large number of producers were able to attend the Lethbridge conference. The Council is dedicated to working with producers, processors and researchers to broaden the agricultural industry's technological base.

Producers and processors need up-to-date technical, economic and market information to capture new opportunities, successfully weather adverse market conditions and adapt to new economic realities. To promote a further exchange of information between researchers and producers and to discuss future research needs, the Council will hold the third Farming for the Future Conference on March 18, 1988, in Calgary. For details on this conference, readers may call Alberta Agriculture's Research Division in Edmonton at 427-1956.

One of the unique features of Farming for the Future is the extent to which the performers and users of research are involved in the operation of the program. Representatives of both groups actively participate in the decision making process – from project selection to information dissemination. This approach has allowed us to successfully combine the theoretical knowledge of the scientist with the practical know-how of the producer. Those who will be attending the third Farming for the Future Conference will see this cooperative endeavor in action.

Diversification or specialization?

Identifying the alternatives

"Whenever there is difficulty in moving conventional prairie grains," says Dr. Terry Veeman, "either in adequate volumes or at acceptable price levels, the interest of farmers, policy-makers, and researchers quickly turns to alternative crops and crop diversification." Dr. Veeman, an agricultural economist at the University of Alberta, admits that the idea of growing alternative crops is appealing in times such as these, but he remarks that under some circumstances these crops may be less profitable for producers than conventional crops.

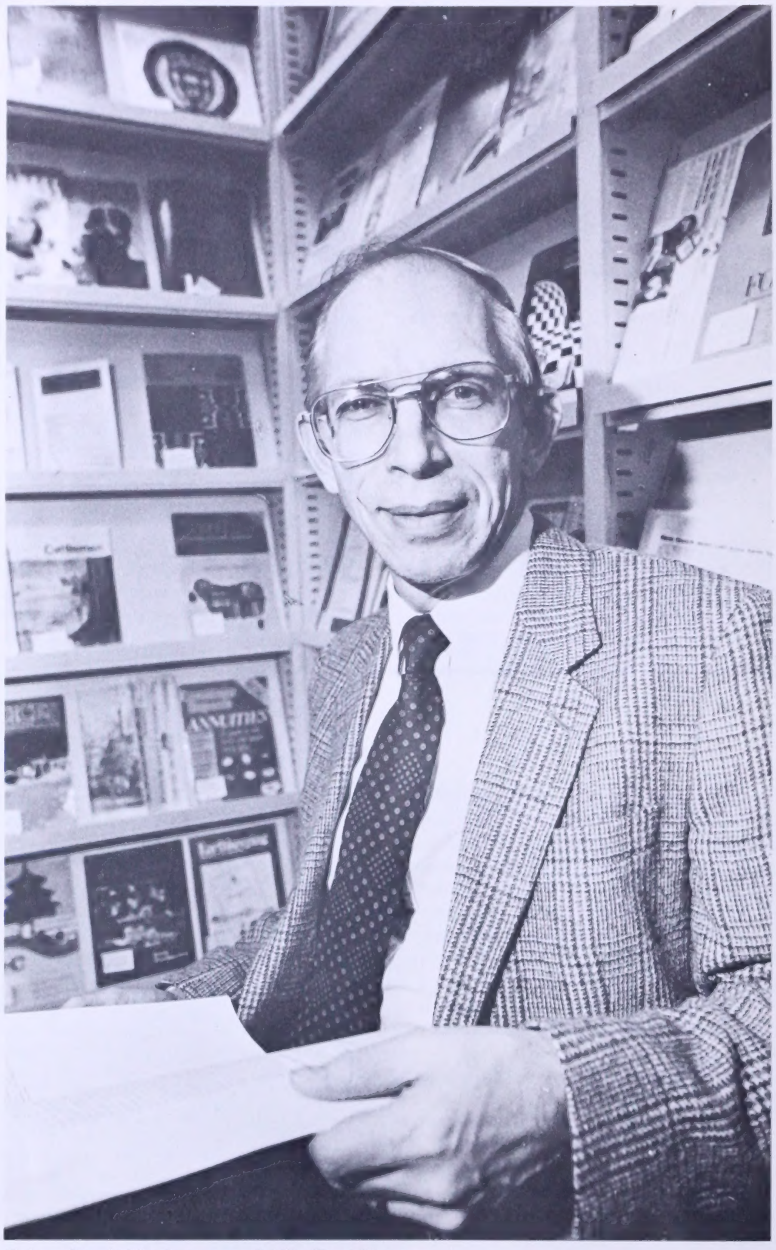
Speaking to the Alternative Crops Conference in Lethbridge last November, Dr. Veeman told his audience that while diversification often reduces risks inherent in the conventional grain markets, some special crops may be more vulnerable than conventional crops to adverse growing conditions, for instance, drought and early frost.

What's more, says Dr. Veeman, "Specialty crops are especially sensitive to market demands for the product." In recent years, he notes, American farmers have been in the process of transferring cropland into grassland reserves, creating a greater demand for Alberta forage seed. Also, there is at present a market niche in Europe for prairie dry field peas. But in Dr. Veeman's estimation, there is uncertainty with regard to the medium and long-run market prospects for both of these crops.

"Specialty crops are especially sensitive to market demands for the product."

Dr. Veeman suggests producers consider other opportunities for diversifying their operations, such as livestock, non-traditional wheats (utility, winter, soft white, etc.), and non-agricultural (off-farm) activities. He also believes that further sub-regional specialization might be encouraged. For instance: "the growing of high-protein wheat in southern Saskatchewan and south-eastern Alberta, the production of malting varieties of barley in much more circumscribed areas than at present, the growing of newer higher-yielding wheat and barley varieties in the more northerly black soil zones, the increased use of winter wheat in the drier zones and soft white wheat in the irrigation districts, if the market permits."

Such a production and diversification strategy, ventures Dr. Veeman, might allow the prairies to "fine tune" their comparative advantage in grains, and would involve diversification in an area of prairie strength.



University of Alberta economist Dr. Terry Veeman

Dr. Veeman is not disputing that there are potential short-term and long-term benefits from diversification. In fact, he encourages farmers to take advantage of them. He also acknowledges that there are often side benefits to specialty or alternative crop production. For example, they may create needs for new input supply industries, or transport, handling and processing industries. But he emphasizes that specialty and alternative crop production is constrained by market demand, and that the relative benefits of diversification must always be compared to the possible benefits of specialization which are foregone by not concentrating on a narrower range of products. Farmers, he concludes, would be wise to watch these markets closely and try to retain flexibility in future cropping patterns.